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A MILK-QUALITY IMPROVEMENT PROGRAM FOR EXTENSION WORKERS

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INTRODUCTION

There are two outstanding reasons for encouraging the production of high-quality milk and cream on the farm. The first is that an adequate supply of wholesome milk is of vital importance to the welfare of the Nation and the growth and development of the people. Nutrition specialists state that a normal growing child should consume liberal quantities of milk. A pint per day should be provided for all children, and during the years of rapid growth a quart a day is desirable. Adults should consume at least a pint of milk daily, or its equivalent in butter, cheese, and ice cream. Per capita consumption of milk in the United States has gradually increased, but many children and adults still consume less than the optimum amount.

The second reason is that the dairy industry could add millions of dollars to its annual receipts if only the finest quality of milk and cream were produced. Losses that result from the production of milk that can not be marketed because of its low quality would be avoided, and consumption would be stimulated by supplying the public with adequate quantities of a safe, wholesome, palatable product.

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For these reasons the problem of improving the quality of the Nation's milk supply should be of deep concern to all agencies interested in promoting the well-being of the people and the economic advancement of the dairy farmer.

This problem is, however, essentially an agricultural responsibility. The leadership and vision for solving it should be supplied by the agricultural extension agencies of the States, and can well be coördinated with the regulatory work of health departments and other control agencies. Enforcing certain arbitrary regulations may bring about a wholesome milk supply, but constructive and permanent improvements can be achieved only through proper education of the producers. The task of this educational work naturally falls to the State departments of agriculture and to the State colleges of agriculture through their extension services.

Extension work on quality-milk production need not interfere with the regulatory activities of the constituted authorities. The health departments and other designated agencies have the power to enforce laws and regulations, and they should be the final authority on the quality of milk that can be marketed in the community which they are delegated to protect. After these standards of quality have been set the big question is, How can farmers efficiently and economically produce milk which will meet these standards? Unquestionably, the agricultural agencies are the instrumentalities to which farmers logically look for solution of their problems. Educational and extension work of this sort is certainly in direct line with the responsibility and experience of these agencies, and therefore it is clearly their business and duty to promote it.

AN EXTENSION PROGRAM

The program outlined in this publication is suggested as a guide for extension workers to follow in conducting milk-quality improvement work. To be most effective, the project should be operated on the area plan—that is, the work should be concentrated in a limited area of one to three counties at the start. The principal objective of this educational effort should be to bring about the general adoption of approved sanitation practices in the production of milk and cream on all dairy farms in the area. When the producers in the selected area have been taught the essentials of quality-milk production and are practicing the approved sanitation methods the area can be used as a demonstration area in extending the work to other areas or counties until the entire State has been covered.

As soon as the State extension director and the State dairy specialist have adopted a definite program for improving the quality of milk in their State they should select an area in which to start the work. This should naturally be an area in which dairying is a major enterprise. It should also be one in which the county agent or agents are interested in dairying and adept in inaugurating and carrying on new projects.

Some beneficial results that may be expected from a successful campaign are: (1) Increased returns to the producers as a result of having a higher-quality milk or cream for sale; (2) an increase in the supply of wholesome dairy products, which should result in increased consumption; and (3) a wider market for dairy products.

DIVISION OF RESPONSIBILITY

Direction of the project to improve the quality of milk in a State or in a selected area should be assumed by the State extension service. The United States Department of Agriculture, through the Extension Service and the Bureau of Dairy Industry, will cooperate to the fullest possible extent in developing such a program. A representative will be sent upon request to assist in making a survey of the area selected and in inaugurating the program by attending State and regional meetings. The Department of Agriculture is in position to furnish helpful information in the form of bulletins, leaflets, lantern slides, film strips, motion pictures, and blue prints.

The State dairy specialist will be expected to (1) assume active direction of the project, (2) develop cooperation with interested agencies, (3) arrange for conferences of these agencies, (4) conduct or supervise surveys, and (5) prepare information for the press.

The county agricultural agent will be expected to (1) make arrangements for holding county meetings, (2) stimulate local interest by personal contact with dairy farmers, by distribution of circular letters, and by cooperation with the schools and the press, (3) arrange county demonstrations and tours, and (4) assist with the survey work in his county.

The milk producers and other cooperators will be expected to (1) follow the recommendations of the improvement committee, and (2) assist the county agent in arranging county meetings and in conducting demonstrations.

Other cooperating agencies, such as the milk producers' associations and milk dealers' organizations will be expected to assist by (1) arousing the interest of their patrons through information circulars and other means, (2) making sediment tests, temperature tests, and methylene-blue tests of the milk delivered by their patrons, and (3) aiding in gathering survey data.

The State and local health departments will be expected to cooperate by furnishing information for the survey.

ORGANIZATION AND COOPERATION

FIRST CONFERENCE

After the area has been selected the State dairy specialist should call a conference to be attended by the county agents of the area, the dairy-project leaders, members of the local producers' and distributors' organizations, and representatives of the State and local health departments and of the State department of agriculture.

At this conference sentiment and enthusiasm for a milk-quality improvement program should be created. The State dairy specialist or a representative of the United States Department of Agriculture should explain the nature and purpose of the campaign.

Arrangements should also be made at this conference for conducting a survey of the area to obtain information with which to answer the following questions: Is the present supply of market milk and cream adequate for the area? Is the present supply of milk and cream of the best quality? Will the producers and consumers of the area benefit by an improvement in quality?

The State dairy specialist should have active charge of the survey, and the county agents should act as his first assistants. Those present at the conference may be able to furnish much of the information desired. In other cases a complete survey will be necessary. Information on the following points should be obtained by the survey:

Market requirements for whole milk or by-products.
  Grades and prices of milk now being sold.
  Approximate amount of each grade sold.
  Is there a sufficient amount of each grade produced at the present time?
Present production methods and conditions.
  Number and condition of dairy barns.
  Number and condition of milk houses.
  Methods used in cleaning and treating utensils to kill bacteria.
  Facilities for cooling and storing milk.
  Where possible, an index to present bacterial count and sediment.[1]
Present regulations and inspection.

SAMPLE SURVEY BLANK

(Front)

A. MARKET REQUIREMENTS (based on data for last calendar year)

[Sources of information: Producers' and distributors' organizations, State department of agriculture, milk inspectors, etc.]

Milk used for—	Present supply			Grade	Average price	Population of market center	Potential requirements
	Total produced locally	Amount shipped in	Amount shipped out				
	Pounds	*Pounds*	*Pounds*				
Market milk							
Market cream							
Manufacturing							

Location of nearest Milk plant _____

Products plant _____

Shipping (cooling) station _____

[1] Where no laboratory records are available, it may be necessary to collect samples at milk plants and run the sediment test and the methylene-blue test (described on pp. 16 and 17) in order to obtain the index.

SAMPLE SURVEY BLANK—Continued

(Back)

B. Present Production Methods and Conditions

[Sources of information: State department of agriculture, dealers, public health authorities, milk inspectors, field men for producers' organizations, etc.]

1. EQUIPMENT

Type of equipment	Total number	Condition				Note.—Take into consideration ventilation, light, type of floors; milk house attached or separated from barn	
		Excellent	Good	Fair	Poor		
Dairy barns							
Milk houses							
						Type	Efficiency
Coolers							
Storage tanks							
Equipment for treating utensils to kill bacteria							

2. BACTERIAL COUNT

Number of counts made	Range		
	Under 500,000	500,000 to 1,000,000	Over 1,000,000

3. SEDIMENT

Number of tests made	Range			
	Clean	Fairly clean	Dirty	Very dirty

SECOND CONFERENCE

After the State dairy specialist has summarized the information obtained from the survey he shall call a second conference of those who attended the first conference. At this conference he should present the results of the survey and discuss the needs of the area and methods of improvement based on (1) clean, healthy cows and milkers, (2) small-top pails, (3) care of milk utensils, (4) cooling and storage of milk, and (5) buildings for housing cattle and handling milk.

An improvement committee should be organized to develop and carry on the work. It should be composed of the State dairy specialist, the county agent or agents, and a representative of each of the following: State department of agriculture, State and local

health departments, and producers' and dealers' organizations. This improvement committee shall select the leading producers of the area and arrange for a meeting of these producers at a "delegate" conference. The committee shall also arrange for the farmers' meetings which are to follow, and cooperate with schools and local newspapers in furthering the program.

THIRD CONFERENCE

A third conference, or delegate conference, should then be called, in which the leading producers of the area are to meet with the improvement committee. The improvement committee shall present the results of the survey, discuss the need for improving the quality of milk produced in the area, and advise the delegates of the action taken at previous conferences.

Plans should also be made at this conference for prosecuting the campaign proper. The cooperation and support of the leading producers will be required in carrying out the campaign and in obtaining the cooperation of the other producers in the area.

STIMULATING INTEREST IN THE CAMPAIGN

For one or two weeks immediately after the third conference a concerted effort is made to bring the proposed milk-quality improvement program to the attention of all interested agencies—producers, dealers and distributors, and consumers. The press is a very effective aid in stimulating interest in any movement of importance to the welfare of the community, and those in charge of the milk-quality improvement program should overlook no opportunity to supply the press with information and news about the meetings and the progress of the campaign. The local newspapers will be glad to publish an account of the conditions found in the survey, interviews with the county agents and State dairy specialist on the importance of quality in milk, and suggestions by other officials for improving the quality of the milk supply.

In preparing special articles for newspaper use, care should be exercised to stress the need for milk-quality improvement in such a way as to show the importance of the campaign without unnecessarily prejudicing the consumer against the present milk supply. In circular letters to the producers the county agents or State specialists may emphasize in detail the need for improvement, acquaint the producers with the purpose of the meetings that are to follow, and urge them to attend these meetings.

With the cooperation of the county superintendents of schools, it should be practicable to promote in the schools essay and poster contests on the subject of high-quality milk. Such contests are of considerable value not only in stimulating interest in the production of high-quality milk, but in increasing the consumption of dairy products.

SERIES OF FARMERS' MEETINGS

When sufficient interest in the proposed movement has been aroused, a series of farmers' meetings, arranged by the improvement committee, should be held in the area selected. The number of meetings will depend upon the size of the area to be covered by the campaign. A sufficient number of meetings should be held to enable

every dairyman in the territory to have easy access to at least one meeting.

At these meetings there should be discussions, either by the State dairy specialist or by a representative of the United States Department of Agriculture, on the relation between producing high-quality milk and increased incomes and on the methods to be used in the production of high-quality milk. Demonstrations of the methylene-blue test and of the sediment test should be given.

LISTING ALL PROSPECTIVE COOPERATORS

Every milk producer in the area should have an opportunity to join in the movement. At the farmers' meetings the county agent and dairy specialist should obtain the names of all prospective cooperators in the area. An enrollment card similar to the one shown herewith should be mailed or otherwise distributed to each producer on the list, with the request that he check the improved practices which he intends to adopt or improvements which he intends to make, such as construction of a milk house, ice house, cooling tank, or steaming cabinet, or the remodeling of a barn or milk house, etc. If interest in improvement is apparent, demonstration tours should be arranged so that good dairy production methods can be studied on farms where they are practiced. Farms may also be chosen where special subprojects on disease control, cleaning and clipping cows, small-top pails, proper care of dairy utensils, cooling, barn arrangement, and milk-house construction can be demonstrated.

SAMPLE ENROLLMENT CARD

DEAR SIR:

The attached return card is for your use in enrolling in the campaign for the production of higher quality milk in _____ County. This campaign is indorsed by our leading dairymen and county dairy farmers' committee. Production of quality milk depends to a large extent on the five principles stated below. Carefully check each item as directed and return.

_____
(Name of leader)

_____
(Address)

I desire to enroll in the campaign for better milk production in _____ County. I am now following the practices as checked on the left and agree to follow those checked on the right.

I now		I agree to
☐	Have clean, healthy cows and milkers. (Cows, to be healthy must be negative to the tuberculin test.)	☐
☐	Use small-top milking pails.	☐
☐	Treat all dairy utensils to kill bacteria.	☐
☐	Cool milk and cream promptly to 50° F. or below.	☐
☐	Store milk and cream at 50° F. or below.	☐

_____
(Name)

_____
(Address)

KEEPING UP INTEREST

The series of farmers' meetings offers an excellent opportunity for those in charge of the campaign to keep public interest alive. The fact that a meeting is scheduled for a certain community is interesting news to the people of that locality, and the local editor should be glad to publish a story announcing the meeting, as well as giving other information of general nature about the campaign. Where the staff of the local paper is unable to cover a meeting, the county agent or some other designated person should make every effort to supply the paper with information about the attendance at each meeting, the number and names of the cooperators enrolled, the practices to be adopted, and other specific information.

Throughout the series of meetings, the project leaders should send circular letters to all dairy farmers in the area to keep them informed about the progress made at each meeting, or the action taken. These letters should encourage the dairymen to join the movement. Enrollment cards should be inclosed with the letters, so that dairymen who did not attend a meeting will have an opportunity to enroll. Publications issued by the State and Federal Departments of Agriculture on the subject of clean-milk production should be distributed to the prospective cooperators.

FOLLOW-UP WORK

It is necessary for the improvement committee to be active throughout the campaign. The State dairy specialist should not only attend the conferences and meetings, but after the series of meetings has been completed he should remain actively in charge of the campaign. The other members of the committee must look to him for guidance.

To the county agent will fall much of the burden of carrying on the improvement work. While the series of meetings is in progress it may be necessary for him to make personal visits to many dairymen to encourage them to become cooperators. After the series of meetings has been concluded he must give personal service to the cooperators by aiding them with the special problems which they have checked on the enrollment cards and by advising them on further improvements in equipment or methods which they may adopt. Follow-up work and personal contact may also interest others on the "prospect list" in improving certain of their practices. To the county agent also falls the duty of cooperating with the local press and arranging tours and demonstrations to keep interest in the project alive.

The health departments can be of great assistance by taking frequent samples of milk and testing it for bacterial count and by assisting the producers to find and correct the source of high counts. Health officials can also assist by seeing that barns and milk houses are constructed in accordance with the requirements of the health department.

Probably no agency can be of greater service in the follow-up work than the milk dealers' association. Milk dealers should be urged to obtain sediment testers and methylene-blue outfits in order to run tests, at least once a week, on the milk delivered by their

patrons. Whenever a sample of milk shows excessive sediment or a high bacterial count, as indicated by these tests, a visit should be made to the patron's farm in order to correct the trouble. Complete records of all tests should be kept in order to show what improvement in quality is accomplished.

Members of the producers' organization on the improvement committee should keep in close touch with the progress of the campaign. They should render assistance and encouragement to the other producers of the area and permit the use of their farms for demonstration purposes.

MEASURING RESULTS OF THE YEAR'S WORK

At the end of the year a resurvey of the area should be made by the State dairy specialist and the county agent to determine the extent of the improvement. Where the health department officials and milk dealers have cooperated fully, they will be able to supply much of the information required. When this information is not available, however, it should be obtained as in the first survey.

Pictures taken at the time of each survey frequently are an ideal means of showing improvement in conditions.

Blanks similar to the one on page 10 should be sent to each cooperator and to all dairymen on the prospect list to obtain information with which to measure results of the year's work. A second card should be sent to those not replying to the first.

The following items should be considered in summarizing the results:

Number of milk houses built.
Number of farmers who improved their cooling facilities.
Number of barns remodeled.
Number of steaming cabinets built.
Number of herds tuberculin tested.
Improvement of milk supply as shown by—
    Amount of milk rejected.
    Increase in premiums paid for quality milk.
    Laboratory tests.
Number of cooperators.
Number of meetings held and attendance.
Number of demonstrations.

After the results of the year's work have been summarized by the State dairy specialist and the county agent these results should be published. It is suggested that circular letters, giving a summary of the results obtained in the way of quality improvement, be sent to all the dairymen of the area. A card on which the dairyman can express his approval or disapproval of continuing the quality-improvement work in the area should be inclosed with each letter.

See that a description of the campaign and of the results obtained is furnished to the State papers as well as to the local papers. In this way the value of milk-quality-improvement work may be brought to the attention of other areas.

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SAMPLE RESURVEY BLANK

DEAR SIR:

The attached card is for use in determining the value of our campaign for the production of high-quality milk in _____ County. Kindly check the practices adopted and the improvements made, and return.

_____
(Name of leader)

_____
(Address)

I have adopted the practices and made the improvements as checked below:

- ☐ Have clean, healthy cows and milkers. (Cows tuberculin tested yearly.)
- ☐ Use small-top milking pails.
- ☐ Treat all dairy utensils to kill bacteria.
- ☐ Cool milk and cream to 50° F. or below.
- ☐ Store milk and cream at 50° F. or below.
- ☐ Feed highly flavored feeds after milking. (Silage, green alfalfa, rape, kale etc.)
- ☐ Built new dairy barn.
- ☐ Remodeled dairy barn.
- ☐ Built dairy house.
- ☐ Built a steaming cabinet for dairy utensils.
- ☐ Installed cooling equipment.
- ☐ Built a storage tank.
- ☐ Built an ice house.

Has the quality of your milk improved? _____
Have you received any additional premium for your milk? _____ How much? _____
Has there been a decrease in the amount of your milk rejected? _____ How much? _____
From your practical experience, do you favor continuing the campaign for higher quality milk production? _____

_____
(Name)

_____
(Address)

ESSENTIAL RULES AND PRACTICES FOR PRODUCING HIGH-QUALITY MILK

The production of high-quality milk is not beyond the ability of any dairyman who understands the basic principles involved and who will carefully apply approved practices. Extension agents and others engaged in promoting quality-milk production should emphasize the following important rules or practices:

GENERAL SANITATION

Have a periodical medical examination made of each person on the farm to determine whether he may be a "carrier" of typhoid, tuberculosis, or other infectious disease. Allow no person who has a contagious or infectious disease or who has sore throat to come in contact with milk or milk utensils. Consult a physician on suspicious cases of sickness.

Have the water supply tested yearly or oftener for possible presence of harmful bacteria. Do not use water from a contaminated source. Have wells and cisterns tightly curbed and covered to prevent entrance of surface drainage, dust, or dirt.

See that the privy meets the recommendations of the State board of health and is located away from dairy buildings on a site where

drainage is away from water supply and dairy buildings. Keep the vault tightly screened and covered.

Control flies by removing accumulations of manure from the yards daily or at intervals of not more than a week. Spread the manure on the fields or place it in a tightly closed or screened manure pit, equipped with a fly trap. Use effective fly sprays and fly traps. Allow no decaying refuse to accumulate.

BARN AND YARD

Provide 4 square feet of window space per stall, evenly distributed in the barn, and allow 500 cubic feet of air space per stall. Control ventilation either by adjustable flue system or by windows hinged at the bottom. Avoid direct drafts or strong air currents.

Have the stable floor tight, smooth, and impervious to moisture. Have a concrete manure gutter 16 inches wide and 8 inches deep; simply constructed mangers that are easily cleaned and of impervious material; swinging stanchions; iron stall rails; and milking stools, currycombs, and brushes that are easily cleaned.

Remove all manure from the barn twice daily, and at least one hour before milking time. Keep the stable free from dust and cobwebs. Feed dusty feeds after milking or long enough before milking to allow dust to settle out of the air. If there is storage space above the stable, the ceiling should be tight, to keep dust and dirt out of the stable. Paint or whitewash walls and ceilings at least once each year.

Have the yards drain away from stable and water supply and keep them free from mudholes. Remove all droppings at least once a week.

MILK HOUSE

The building in which the milk is handled should be convenient to the barn. It should have a tight, smooth floor which is impervious to moisture. The floor should slope to a bell-trap drain connected to a drainpipe leading well away from the milk house.

Walls and ceilings should be painted and kept free from dust and cobwebs.

Doors, windows, and other openings should be tightly screened. Screen doors should open outward and there should be full-length screens on the outside of the windows.

Window space should equal 10 per cent of the floor space.

There should be an adjustable outlet flue in the roof of the milk house; ventilate with windows when necessary.

The floors should be flushed with water frequently and scrubbed with alkali powder when necessary. Nothing but dairy utensils should be stored in the milk house. A plentiful supply of cold water in the milk house is necessary.

UTENSILS

Coolers, cans, and all other utensils with which milk comes in contact should be made of smooth, durable material which does not affect milk. They should be free from rust and dents. Cans should have tightly fitting covers which provide no place for water or dirt to accumulate. All milking pails should be of the small-top design.

CARE OF MILK UTENSILS

Immediately after using milk utensils, rinse them with cool water; then wash and scrub them with hot water, an alkali washing powder, and a stiff fiber brush. Then rinse them again in hot water. A galvanized-iron round-bottom sink or vat is a decided convenience for washing utensils. It should have two compartments, one for washing and one for rinsing. It should have a drain, and water should be piped to it. Fiber brushes of various shapes and sizes should be provided for washing the utensils.

The utensils should be treated to kill bacteria by steaming them in a cabinet for five minutes at a temperature of at least 200° F., or by immersing them for at least two minutes in a solution containing 200 parts of available chlorine per million.

If many cows are kept, the most satisfactory method of treating utensils to kill bacteria is by means of a steaming cabinet. The boiler used to supply steam for the cabinet will also furnish hot water for washing the utensils. A 3-horsepower boiler is recommended for a dairy of 10 cows, and a 5-horsepower boiler is satisfactory for a dairy of 20 cows. If chlorine is used to treat the utensils, some means must be provided for obtaining hot water with which to wash them.

After utensils have been treated to kill bacteria, they should be kept in the steaming cabinet or inverted in a place free from dust, dirt, and insects until they are required for further use.

CLEANING MILKING MACHINES

Immediately after milking rinse the machine by placing the teat cups in a pail of cold or lukewarm water and using the vacuum to draw the water through the machine. Break the flow occasionally by pulling the teat cups out of the water and then immediately immersing them again. Do this ten or twelve times.

Place the cups in a pail of hot water containing washing powder. Repeat the rinsing process and scrub the cups and the tubing with a brush.

Rinse the machine again by drawing clean, warm water through it.

Detach the long milk tube with claw and teat cups from the head of the pail (plug air tubes on machines of inflation type) and place all detached parts in a tank or can of clean water. See that all parts are entirely submerged. Heat the water to 160° or 165° F. Allow the water to cool and leave the parts in the water until the next milking. Instead of being heated in water, the parts may be placed in a chlorine solution containing 200 parts of available chlorine per million. Wash and treat the pail the same as other dairy utensils.

For the best results take the machine entirely apart daily and wash all parts thoroughly with brushes and hot water containing washing powder. In any case, do this at least twice a week.

CLEAN COWS AND MILKING

The body of the cow, especially those parts of the belly, flanks, and udder that are immediately above the milk pail, may be the source of much dirt in the milk, or of bacterial contamination.

Provide daily plenty of clean, absorbent bedding material, such as straw, shavings, and similar materials.

Thoroughly groom the cows with brush and currycomb at least once and preferably twice a day. Groom at least one hour before milking time. Wash cows that are badly soiled.

Clip the hair from the udder, flanks, and belly closely every few months or as needed.

At milking time wipe the udder, teats, and flanks with a damp cloth. Wash the udders that become soiled after the cows are groomed. In no case use milking pails for this purpose.

When ready to milk put on clean outer clothing made of washable material of smooth texture and wear this clothing only while milking and handling milk. Keep all milking clothes clean.

Wash and dry the hands before starting to milk. Milk only with a milking machine or with clean, dry hands, and use a small-top pail.

As soon as a cow is milked, remove her milk from the stable and strain it through a sterile, absorbent cotton pad or special filter cloth, either of which may be obtained in sanitary packages or rolls from dairy-supply houses. Use each strainer pad for one milking only.

COOLING, STORING, AND TRANSPORTING MILK

A large number of the bacteria found in milk when it reaches the consumer are there because the milk was improperly cooled and kept at too high a temperature during storage, transportation, and delivery.

Cool the milk immediately to 50° F. or under, either by means of a surface cooler, by setting the can in ice water, or by mechanical refrigeration. Use an accurate thermometer for taking all temperatures.

Keep the milk at 50° F. or under by means of a storage tank with ice water or by mechanical refrigeration. Keep all containers tightly covered to protect the milk from dust and dirt while in storage.

Protect the milk from the sun and dirt at all times, from the point of storage until it is delivered.

PREVENTING OBJECTIONABLE FLAVORS AND ODORS IN MILK

Milk is often made unsalable by feed and weed flavors. Such flavors are imparted to milk mainly through the body of the cow. In most instances, however, they are imparted to milk only for a period of from four to seven hours after the cow consumes the feed.

Feed all highly flavored feeds, such as silage, cabbage, turnips, rape, kale, and similar feeds immediately after milking, never just before milking.

If possible, keep cows off pastures that are infested with weeds which impart their flavor to milk. Otherwise remove the cows from the pasture two to four hours before milking time, or longer if necessary.

Immediately after milking each cow, run the milk over an aerator (this may be a surface cooler). Always aerate the milk in an atmosphere free from dust and odors.

HEALTHY COWS

Cows should be tested for tuberculosis at least once each year. All reactors should be removed from the herd, and the stables disinfected. The test should be repeated in six months if reactors are found. Only animals that have been tested and found free of the disease should be added to the herd.

If cows have aborted for any cause, the herd should be tested for infectious abortion. All reactors should be removed, and the stables disinfected. Only animals that have been tested and found to be free of the disease should be added to the herd.

To detect the presence of garget or other udder diseases, milk the first stream from each teat on a fine sieve, black cloth, or glass at least once each week. Milk that appears watery, lumpy, stringy, or bloody, or contains flecks or specks is abnormal. Discard all such milk as well as milk from udders that show any signs of abnormal conditions. Remove affected cows from the milking herd.

DAIRY FARM SCORE CARD

In determining the sanitary conditions on dairy farms a score card is frequently used. The score card is part of a system of giving credit for good conditions and cutting or marking down for bad ones. The card has separate columns for equipment and methods and allows a total of 40 and 60 points, respectively. This apportionment of points is made for the purpose of emphasizing the importance of good methods and of giving credit for cleanliness.

The following score card is used and recommended by the Bureau of Dairy Industry, United States Department of Agriculture.

SCORE CARD FOR SANITARY INSPECTION OF DAIRY FARMS

[Front of card]

Owners or lessee of farm_____

P. O. address_____ State_____

Total number of cows_____ Number milking_____

Gallons of milk produced daily_____

Product is sold by producer to families, hotels, restaurants, stores, or to_____

_____ dealer. (Check which.)

For milk supply of_____

Permit No._____ Date of inspection_____, 193__

Remarks:_____

_____

_____

_____

_____

*(Signed)*_____

Inspector.

[Back of card]

Equipment	Score: Perfect	Score: Allowed
COWS		
Health	6	
Apparently in good health	1	
If tested with tuberculin within a year and no tuberculosis is found, or if tested within 6 months and all reacting animals removed	5	
(If tested within a year and reacting animals are found and removed, 3.)		
Food (clean and wholesome)	1	
Water (clean and fresh)	1	
STABLES		
Location of stable	2	
Well drained	1	
Free from contaminating surroundings	1	
Construction of stable	4	
Tight, sound floor, and proper gutter	2	
Smooth, tight walls and ceiling	1	
Proper stall, tie, and manger	1	
Provision for light: Four square feet of glass per cow	4	
(3 square feet, 3; 2 square feet, 2; 1 square foot, 1. Deduct for uneven distribution.)		
Bedding	1	
Ventilation	7	
Provision for fresh air, controllable flue system	3	
(Windows hinged at bottom, 1.5; sliding windows, 1; other openings, 0.5.)		
Cubic feet of space per cow, 500 feet	3	
(Less than 500 feet, 2; less than 400 feet, 1; less than 300 feet, 0.)		
Provision for controlling temperature	1	
UTENSILS		
Construction and condition of utensils	1	
Water for cleaning	1	
(Clean, convenient, and abundant.)		
Small-top milking pail	5	
Milk cooler	1	
Clean milking suits	1	
MILK ROOM OR MILK HOUSE		
Location: Free from contaminating surroundings	1	
Construction of milk room	2	
Floor, walls, and ceilings	1	
Light, ventilation, screens	1	
Separate rooms for washing utensils and handling milk	1	
Facilities for steam	1	
(Hot water, 0.5.)		
Total	40	

Methods	Score: Perfect	Score: Allowed
COWS		
Clean	8	
(Free from visible dirt, 6.)		
STABLES		
Cleanliness of stables	6	
Floor	2	
Walls	1	
Ceilings and ledges	1	
Mangers and partitions	1	
Windows	1	
Stable air at milking time	5	
Freedom from dust	3	
Freedom from odors	2	
Cleanliness of bedding	1	
Barnyard	2	
Clean	1	
Well drained	1	
Removal of manure daily to 50 feet from stable	2	
MILK ROOM OR MILK HOUSE		
Cleanliness of milk room	3	
UTENSILS AND MILKING		
Care and cleanliness of utensils	8	
Thoroughly washed	2	
Treated with steam for 15 minutes	3	
(Placed over steam jet, or scalded with boiling water, 2.)		
Protected from contamination	3	
Cleanliness of milking	9	
Clean, dry hands	3	
Udders washed and wiped	6	
(Udders cleaned with moist cloth, 4; cleaned with dry cloth or brush at least 15 minutes before milking, 1.)		
HANDLING THE MILK		
Cleanliness of attendants in milk room	2	
Milk removed immediately from stable without pouring from pail	2	
Cooled immediately after milking each cow	2	
Cooled below 50° F	5	
(51° to 55°, 4; 56° to 60°, 2.)		
Stored below 50° F	3	
(51° to 55°, 2; 56° to 60°, 1.)		
Transportation below 50° F	2	
(51° to 55°, 1.5; 56° to 60°, 1.)		
(If delivered twice a day, allow perfect score for storage and transportation.)		
Total	60	

Equipment _____ + Methods _____ = _____ **Final Score**

NOTE 1.—If any exceptionally filthy condition is found, particularly dirty utensils, the total score may be further limited.

NOTE 2.—If the water is exposed to dangerous contamination, or there is evidence of the presence of a dangerous disease in animals or attendants, the score shall be 0.

SOME WAYS OF DETERMINING QUALITY OF MILK

Milk to be classed as of good quality should have a low bacterial content, be free of visible dirt, and have no abnormal flavors or odors. Abnormal flavors and odors may be detected by taste and smell after sufficient practice. The bacterial content may be determined approximately by the methylene-blue test, and the relative amount of sediment or visible dirt can be determined by the sediment test.

THE METHYLENE-BLUE TEST

The methylene-blue test is a simple method of determining the approximate number of bacteria in the milk, and consequently indicates the keeping quality of the milk. It is also known as the reduction test. The bacteria in the milk use up the oxygen and liberate reducing substances which reduce or destroy the blue color produced in milk by adding methylene-blue dye, and the milk turns white. The greater the number of bacteria in the milk, the faster the oxygen is used up and the more rapidly the reducing substances are released. The greater the amount of reducing substances present, the less is the time required for the milk to turn white. Therefore, the time required for the milk to turn from blue to white is a measure of the number of bacteria present.

The methylene-blue solution should contain 1 part of dye to 20,000 parts of water. This solution is easily prepared by dissolving one methylene-blue tablet in distilled water or water which has been boiled and cooled, using the amount of water recommended by manufacturers of the tablets. Tablets may be purchased from dairy-supply companies.

To make the test, measure 10 cubic centimeters of milk into a clean test tube. Add 1 cubic centimeter of the prepared methylene-blue solution to the 10 cubic centimeters of milk in the test tube. Place the stopper in the mouth of the test tube, and invert the tube, thereby mixing the dye with the milk.

Place the test tube containing the mixture in a water bath maintained at a temperature of approximately 37° C. or 100° F. Note the time at which the sample is placed in the water bath.

At the end of 20 minutes note the color change, if any, and do so again every hour thereafter until the sample has turned white. Record the total time required for the entire sample to turn white. High-quality raw milk should not decolorize in less than eight hours.

Note the length of time required for the color to change and compute the approximate number of bacteria present in the milk as follows:

Time	Bacteria per cubic centimeter
20 minutes or less	Over 20,000,000.
20 minutes to 2 hours	4,000,000 to 20,000,000.
2 to 5½ hours	500,000 to 4,000,000.
5½ to 8 hours	100,000 to 500,000.
Over 8 hours	Less than 100,000.

SEDIMENT TEST

The sediment test is a simple method of determining the presence of sediment in milk. It will not show the amount of dirt that has been dissolved in the milk or the amount that has been strained out.

Sediment in the milk indicates that unclean methods of production have been used, and the importance of keeping dirt out of milk should be emphasized.

To determine the amount of sediment in milk, warm the milk slightly and then mix it thoroughly by pouring it from one vessel to another three or four times immediately before testing. Take a 1-pint sample of the milk and force it through a sediment tester in which a regulation cotton disk has been inserted. After forcing the milk through the tester, remove the cotton disk and note the relative amount of sediment by comparing the disk with disks from tests of other samples of milk handled in different ways.

LITERATURE AND ILLUSTRATIVE MATERIAL

The following publications and other illustrative material prepared by the United States Department of Agriculture will be found helpful in launching or conducting milk-quality improvement work, and may be obtained by writing to the United States Department of Agriculture, Washington, D. C.

DEPARTMENT PUBLICATIONS

FARMERS' BULLETINS

602, Production of Clean Milk.
976, Cooling Milk and Cream on the Farm.
1078, Harvesting and Storing Ice on the Farm.
1214, Farm Dairy Houses.
1315, Cleaning Milking Machines.
1342, Dairy-Barn Construction.
1393, Principles of Dairy-Barn Ventilation.
1675, Care of Milk Utensils on the Farm.
1069, Tuberculosis in Livestock. Detection, Control, and Eradication.
1408, House Fly and How to Suppress It.
1536, Infectious Abortion of Cattle.
734, Flytraps and their Operation.
1097, The Stable Fly: How to Prevent its Annoyance and its Losses to Livestock.

LEAFLETS

3, Improved Sanitation in Milk Production.
25, Preventing Feed Flavors and Odors in Milk.

BUREAU OF DAIRY INDUSTRY LEAFLETS

D. D. 624, Clean Milk is Easily Produced.
D. D. 581, Turn Cold into Gold.
D. D. 608, Harvest a Crop in Midwinter.
(These bureau leaflets may be obtained from the Bureau of Dairy Industry in quantities sufficient for distribution at meetings of prospective cooperators.)

FILM STRIPS

Production of Clean Milk.
Tests for Determining the Bacterial Quality of Milk.
Farm Dairy Houses.

MOTION PICTURES

Quality Milk (1 reel).

BLUE PRINTS

Dairy Houses.
Ice Houses.
Barns.
Steaming Cabinets.

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